

CLAIMS

1. An optical disc apparatus comprising:

a laser light source for emitting a laser beam for irradiating an optical disc surface via an objective lens;

a light detector for detecting reflected light of the laser beam emitted from said laser light source and reflected by said optical disc surface;

a focus controller for controlling a focus condition by moving said objective lens in a direction of an optical axis in accordance with a focus error signal generated by said light detector;

a tracking controller for controlling a tracking condition by moving said objective lens in a horizontal direction in accordance with a tracking error signal generated by said light detector;

a disc signal discriminator for discriminating a type of said optical disc on a basis of a focus error signal and a sub beam addition signal obtainable in performing a focus search by moving said objective lens in the direction of optical axis by means of said focus controller; and

a disc information discriminator for discriminating the type of said optical disc in accordance with information recorded on said optical disc,

wherein final discrimination of the type of said optical disc is made on a basis of the type discrimination result of

said optical disc by means of said disc signal discriminator and the type discrimination result of said optical disc by means of said disc information discriminator.

2. The optical disc apparatus according to claim 1, wherein the disc signal discriminator uses a signal level of the focus error signal and the sub beam addition signal as threshold data of quantity of reflected light for discriminating the type of the optical disc.

3. The optical disc apparatus according to claim 1, wherein the disc signal discriminator discriminates whether the optical disc to be discriminated based on the focus error signal and the sub beam addition signal is a CD-ROM, a CD-R, a CD-RW or no disc.

4. The optical disc apparatus according to claim 1, wherein the disc information discriminator discriminates whether the optical disc to be discriminated based on the information recorded on the optical disc is a CD-R, a CD-RW, or a CD-ROM.

5. The optical disc apparatus according to claim 1, wherein with regard to a loaded optical disc, in the case where the type of optical disc discriminated by the disc signal discriminator and the type of optical disc discriminated by the disc information discriminator differ from each other, a priority is given to the type of optical disc discriminated by said disc information discriminator.

6. The optical disc apparatus according to claim 5, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, a signal level obtained by the disc signal discriminator is adopted as a threshold value for discriminating the type of the optical disc used in said disc signal discriminator.

7. The optical disc apparatus according to claim 5, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, an intermediate value between a maximum value of one of the signal levels of optical disc and a minimum value of the other of the signal levels of optical disc obtained by the disc signal discriminator is adopted as a threshold value for discriminating the type of the optical disc used in said disc signal discriminator.

8. The optical disc apparatus according to claim 7, wherein the maximum value of one of the signal levels of optical disc obtained by the disc signal discriminator is used as a maximum value of signal levels in the type of optical disc discriminated by said disc information discriminator.

9. The optical disc apparatus according to claim 7, wherein the minimum value of the other of the signal levels of optical disc obtained by the disc signal discriminator is used

as a minimum value of signal levels in the other type of optical disc not discriminated by said disc information discriminator.

10. The optical disc apparatus according to claim 5, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, an intermediate value between an average value of signal levels in one type of optical disc discriminated by said disc information discriminator and an average value of signal levels in the other type of optical disc discriminated by the disc signal discriminator is adopted as a threshold value for discriminating the type of the optical disc used in said disc signal discriminator.

11. The optical disc apparatus according to claim 10, wherein the average value of signal levels in the type of optical disc discriminated by the disc signal discriminator is determined by averaging a plurality of signal levels obtained in the type of optical disc discriminated by said disc signal discriminator.

12. The optical disc apparatus according to claim 10, wherein the average value of signal levels in the type of optical disc discriminated by the disc information discriminator is determined by averaging a plurality of signal levels obtained by the disc signal discriminator in the type of optical disc discriminated by said disc information discriminator.

13. An optical disc discriminating method in an optical disc apparatus according to any one of claims 1 to 12,

wherein final discrimination of the type of said optical disc is made on the basis of the type discrimination result of said optical disc by means of the disc signal discriminator which discriminates the type of said optical disc on the basis of the focus error signal and a sub beam addition signal obtainable in performing a focus search by moving an objective lens in a direction of optical axis, and the type discrimination result of said optical disc by disc information discriminator which discriminates the type of said optical disc in accordance with information recorded on said optical disc.

14. The optical disc discriminating method according to claim 13, wherein in discriminating the type of optical disc by the disc signal discriminator, signal levels of the focus error signal and the sub beam addition signal are used as threshold data of quantity of reflected light for discriminating the type of said optical disc.

15. The optical disc discriminating method according to claim 13, wherein in discriminating the type of optical disc by the disc signal discriminator, the optical disc to be discriminated based on the focus error signal and the sub beam addition signal is discriminated whether it is a CD-ROM, a CD-R, a CD-RW or no disc.

16. The optical disc discriminating method according

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FIG. 1

to claim 13, wherein in discriminating the type of optical disc by the disc information discriminator, the optical disc to be discriminated based on the information recorded on the optical disc is discriminated whether it is a CD-R, a CD-RW, or a CD-ROM.

17. The optical disc discriminating method according to claim 13; wherein with regard to a loaded optical disc, if the type of optical disc discriminated by the disc signal discriminator and the type of optical disc discriminated by the disc information discriminator differ from each other, a priority is given to the type of optical disc discriminated by said disc information discriminator.

18. The optical disc discriminating method according to claim 17, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, the signal levels obtained by the disc signal discriminator are adopted as threshold values for discriminating the type of the optical disc used in said disc signal discriminator.

19. The optical disc discriminating method according to claim 17, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, an intermediate value between a maximum value of one of the signal levels and a minimum value of the other of the

signal levels obtained by the disc signal discriminator is adopted as a threshold value for discriminating the type of the optical disc used in said disc signal discriminator.

20. The optical disc discriminating method according to claim 19, wherein the maximum value of one of the signal levels obtained by the disc signal discriminator is used as a maximum value of the signal levels in the type of optical disc discriminated by said disc information discriminator.

21. The optical disc discriminating method according to claim 19, wherein the minimum value of the other of the signal levels obtained by the disc signal discriminator is used as a minimum value of signal levels in the other type of optical disc not discriminated by said disc information discriminator.

22. The optical disc discriminating method according to claim 17, wherein when the type of optical disc discriminated by the disc information discriminator is discriminated as the type of the optical disc inserted into the optical disc apparatus, an intermediate value between an average value of signal levels in one type of optical disc discriminated by said disc information discriminator and an average value of signal levels in the other type of optical disc discriminated by the disc signal discriminator is adopted as a threshold value for discriminating the type of the optical disc used in said disc signal discriminator.

23. The optical disc discriminating method according

to claim 22, wherein the average value of signal levels in the type of optical disc discriminated by the disc signal discriminator is determined by averaging a plurality of signal levels obtained in the type of optical disc discriminated by said disc signal discriminator.

24. The optical disc discriminating method according to claim 22, wherein the average value of signal levels in the type of optical disc discriminated by the disc information discriminator is determined by averaging a plurality of signal levels obtained by the disc signal discriminator in the type of optical disc discriminated by said disc information discriminator.